Amendments to the Specification:

Please replace the original Abstract with the amended Abstract which is found at the end of this paper on a separate sheet as required in the rules.

On page 1, please replace the first full paragraph with the following amended paragraph.

The present invention relates to a semiconductor manufacturing process, more specifically, to a deep trench structure manufacturing process, which is able to reduce leakage problems, thereby ~~lifting~~ improving the ~~electrictal~~ electrical performance of products.

Please replace the first, second, third and fourth full paragraphs after the heading "2. Description of the Prior Art" with the following amended paragraphs.

In semiconductor deep trench manufacturing process, with reference to Fig. 1a, a deep trench is formed in a substrate 10 on which a pad oxide layer and a pad nitride layer 11are formed. Then a thin dielectric layer, preferably a nitride layer of which the material is preferably silicon nitride, is formed to cover the sidewall and bottom of the deep trench. Then, a first ~~polymer~~ conductive layer 13 is deposited in the deep trench. The portion of the nitride layer not covered with the first ~~polymer~~ conductive layer 13, which can be poly-silicon, is removed, and the portion of the nitride layer 12 covered with the first ~~polymer~~ conductive layer 13 is left. As shown in the drawing, when the portion of the nitride layer is removed by etching, the nitride layer 12 is usually etched to a level lower than the top of the first ~~polymer~~ conductive layer 13, so that a gap 15 is formed.

Subsequently, according to the deep trench process of the prior art, a portion of the sidewall of the deep trench not covered with the first ~~polymer~~ conductive layer 13

is oxidized by, for example, thermal oxidation to form an oxide layer 14, as shown in Fig. 1b. For the sake of convenient description, the oxide layer 14 refers to a preliminary oxide layer.

An oxide is formed in the deep trench by chemical vapor deposition (CVD) or any other proper method, and etched by dry etching or any other proper method to form a collar oxide layer 16 on the portion of the sidewall of the deep trench not covered with the first ~~polymer~~ conductive layer 13. Then the deep trench is filled with a second ~~polymer~~ conductive layer 17 upon the first ~~polymer~~ conductive layer 13, as shown in Fig. 1c. However, in practical manufacturing process, the collar oxide layer 16 fails to enter the gap 15. Accordingly, the gap 15 still exists even after the collar oxide layer 16 is formed.

Then, portions of the oxide layers 16 and 14 not covered with the second ~~polymer~~ conductive layer 17 are removed by wet etching ~~other~~ or any other proper method. Generally, the oxide layers are etched to a level lower than the top of the second ~~polymer~~ conductive layer 17, as shown in Fig. 1d.

On page 1, please replace the last full paragraph which bridges page 2 with the following amended paragraph.

Finally, the deep trench is filled with a third ~~polymer~~ conductive layer 18 upon the second ~~polymer~~ conductive layer 17, so that the structure as shown in Fig. 1e is finished.

On page 2, please replace the first full paragraph with the following amended paragraph.

The above process has some problems. As stated above, in the deep trench structure, a gap is likely to be formed between the nitride layer 12 and the collar oxide 16, leading to a path for junction leakage, thereby influencing the sub-threshold leakage

and accordingly the ~~electrictal~~ electrical performance of the entire structure. In addition, since the formation of the preliminary oxide layer 14 is due to the reaction between sidewall of the deep trench and oxygen, and a portion of the preliminary oxide layer is removed in the step of removing oxide as shown in Fig. 1d, the critical dimensions of the opening and the upper portion of the deep trench are increased, so as to influence the aspect ratio of the deep trench.

Please replace the first full paragraph after the heading SUMMARY OF THE INVENTION with the following amended paragraph.

An objective of the present invention is to provide a deep trench structure manufacturing process, which can avoid a gap being generated in the structure as a path [[of]] for junction leakage, to reduce sub-threshold leakage and maintain good ~~electrictal~~ electrical performance.

Please replace the third full paragraph after the heading with the following amended paragraph.

According to an aspect of the present invention, a deep trench structure manufacturing process comprises the steps of providing a substrate; forming a deep trench in said substrate; forming a dielectric layer in said deep trench, said dielectric layer covering the sidewall and bottom of the deep trench; filling the deep trench with a first ~~polymer~~ conductive layer; removing a portion of said dielectric layer not covered with the first ~~polymer~~ conductive layer; refilling the deep trench with another dielectric layer covering the sidewall of the deep trench not covered with the first ~~polymer~~ conductive layer; partially removing ~~unnecessary portion of~~ said another dielectric layer; forming a collar oxide layer in the deep trench, said collar oxide layer covering the sidewall of the deep trench not covered with dielectric layers; filling the deep trench with a second ~~polymer~~ conductive layer; removing a portion of said collar oxide layer not

covered with the second ~~polymer~~ conductive layer; and filling the deep trench with a third ~~polymer~~ conductive layer.

On page 3, please replace the misspelled heading Detialed Description of the Preferred Embodiment with the following amended

DETAILED ~~DETIALED~~ DESCRIPTION OF THE PREFERRED EMBODIMENT

Please replace the second and third full paragraphs after the heading Detailed Description of the Preferred Embodiment with the following amended paragraphs.

The structure shown in Fig. 2a is identical to that of Fig. 1a, and therefore the description thereof is omitted herein. In this drawing, reference number 20 is a substrate, 21 is a pad nitride layer, 22 is a nitride layer (SiN in general), 23 is a first ~~polymer~~ conductive layer.

Next, with reference to Fig. 2b, a dielectric layer 25 is formed in the deep trench. The material of the dielectric layer 25 is preferably nitride, and more preferably the same as the material of the nitride layer 22. In the present embodiment, the material of the dielectric layer 25 is SiN. ~~In other words, after~~ After the deep trench is filled with the first ~~polymer~~ conductive layer 23 and the ~~unnecessary~~ portion of the nitride layer 22 not covered by the first conductive layer 23 is removed, the deep trench is refilled with a nitride layer 25, which his of SiN or any other proper material, so that the sidewall of the deep trench not covered by the first conductive layer 23 is covered by the nitride layer 25. Due to the characteristic of the material, the refilled SiN layer 25 enters into a gap 24 between the sidewall of the deep trench and the first ~~polymer~~ conductive layer 23 in practical process. The gap 24 is generated due to the level of the nitride layer 22 being lower than the first polymer 23.

Please replace the last two paragraphs on page 3 which bridge page 4 with the following two amended paragraphs.

[[Than]] Then, ~~an unnecessary portion~~ of the refilled nitride layer 25 is partially removed. Preferably, only the portion of the nitride layer 25 entering into the gap 24 remains, as shown in Fig. 2c.

The subsequent process steps are similar to those of the prior art. With reference to Figs. 2d to 2f, the subsequent steps include forming a collar oxide layer 26, filling the deep trench with a second ~~polymer~~ conductive layer 27, removing an ~~unnecessary~~ upper portion of the collar oxide layer 26, and finally filling the deep trench with a third polymer 28.

On page 4, please replace the first full paragraph with the following amended paragraph.

As shown in the drawings, there is no gap existing in the deep structure made by the process in accordance with the present invention. Accordingly, the occurrence of leakage can be reduced, and the sub-threshold performance can be kept good. In addition, the process in accordance with the present invention does not need to form the preliminary oxide layer on the sidewall of the deep trench. Thus, in the step of partially removing ~~the unnecessary portion of~~ the oxide layer, the critical dimension of the diameter of the deep trench will not be increased, and therefore the aspect ratio of the deep trench can be maintained high.